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3685-CIP/OE 042

REMARKS

Reconsideration and allowance of the above-amended application are respectfully requested.

The application has been amended to be in condition for allowance. Independent Claims 20 and 23 have been amended to clarify their language with respect to the resonance nature of the optical coupling between the two recited WGM resonators.

See, e.g., FIGS. 6A, 8, 9A, 9B, 13, 15A and 16A and the associated textual descriptions throughout the specification.

The paragraph [0037] on page 14 specifically provides that "[t]he resonators 610 and 620 are placed close to or in contact with each other to allow for direct optical coupling under proper resonance conditions. Alternatively, an optical coupling mechanism may be placed between the resonators 610 and 620 to assist and facilitate the inter-resonator optical coupling."

Hence, the resonance condition of the two coupled WGM resonators is described in the original specification. No new matter is added.

Claims 1-23 stand rejected either under 35 USC 102(e) over U.S. Patent No. 6,580,851 alone or under 35 USC 103(a) over U.S. Patent No. 6,580,851 in further view of US 2002/0044739. These contentions, however, are respectfully traversed.

Claims 1-23 recite optical coupling between two WGM resonators to transmit light through the two coupled WGM

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resonators and optical tuning of at least one resonator. For example, Claim 1 recites that "said first and said second optical resonators are optically coupled to allow for light coupling from a first whispering gallery mode in said first optical resonator to a second whispering gallery mode in said second optical resonator."

In contrast, the U.S. Patent No. 6,580,851 discloses optical coupling of WGM resonators to two optical waveguides in such a way that each individual WGM resonator is optically coupled to the waveguides without being optically coupled to another WGM resonator. FIGS. 3 and 4 in U.S. Patent No. 6,580,851 illustrate the optical coupling between the two waveguides and one WGM resonator. FIG. 7 in U.S. Patent No. 6,580,851 further shows how the coupling in FIGS. 3 and 4 is applied to multiple resonators that are individually coupled to the same two waveguides. However, these WGM resonators are not optically coupled to each other and cannot transmit light that transmits through another WGM resonator. Notably, the U.S. Patent No. 6,580,851 specifically teaches that each resonator in FIG. 7 has a different resonance frequency. See, Col. 5, lines 59-64. As such, different WGM resonators have different resonance frequencies in order to be in resonance with different optical channels in the two waveguides. Therefore, two different WGM resonators are not in resonance with each other.

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An optical channel at one optical channel frequency in resonance with one WGM resonator cannot be in resonance with another WGM resonator in FIG. 7 and therefore cannot be coupled into another WGM resonator. Under this design, the U.S. Patent No. 6,580,851 fails to teach that "said first and said second optical resonators are optically coupled to allow for light coupling from a first whispering gallery mode in said first optical resonator to a second whispering gallery mode in said second optical resonator" as recited in Claim 1.

For this reason alone, Claim 1 is patentable under 35 USC 102(e) over U.S. Patent No. 6,580,851.

Claim 1 further recites that "at least one of said first and said second optical resonators is tunable in response to a control signal to change a property of an optical signal passing through said first and said second optical resonators."

Admittedly, as the Office Action correctly points out, the U.S. Patent No. 6,580,851 indeed discloses that the WGM resonators in FIG. 7 can be tunable. However, such tuning is premised on the condition that different WGM resonators have different resonance frequencies. Because two different WGM resonators in FIG. 7 of U.S. Patent No. 6,580,851 cannot transmit the same light, there cannot be an optical signal passing through two different WGM resonators. Therefore, the tuning in U.S. Patent No. 6,580,851

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cannot change the property of an optical signal passing through two different WGM resonators.

This difference between Claim 1 and the U.S. Patent No. 6,580,851 further shows that Claim 1 is patentable under 35 USC 102(e) over U.S. Patent No. 6,580,851.

Claim 20 as amended recites "optically coupling first and second optical resonators via evanescent fields in resonance to transmit light through both said first and second optical resonators." As discussed above, two different WGM resonators in FIG. 7 of U.S. Patent No. 6,580,851 are at different resonance frequencies and, therefore, cannot be in resonance. As a result, two different WGM resonators in FIG. 7 of U.S. Patent No. 6,580,851 cannot "transmit light through both said first and second optical resonators." Therefore, Claim 20 as amended is patentable under 35 USC 102(e) over U.S. Patent No. 6,580,851.

Claim 20 further recites that "at least one of the first and the second optical resonators being dynamically tunable to change optical transmission in response to a control signal" and changing the control signal to adjust optical transmission through both said first and second optical resonators. None of the WGM resonators in FIG. 7 of U.S. Patent No. 6,580,851 can be tuned by "changing the control signal to adjust optical transmission through both said first and second optical

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"resonators" because there cannot be such an optical transmission through two different WGM resonators in FIG. 7 of U.S. Patent No. 6,580,851.

For at least the above reasons, Claim 20 as amended is patentable under 35 USC 102(e) over U.S. Patent No. 6,580,851.

Similar to Claim 20 as amended, Claim 23 as amended is also patentable over under 35 USC 102(e) over U.S. Patent No. 6,580,851.

In addition, the function and operation of the devices and techniques in Claims 1-23 in their current forms are different from the device in FIG. 7 of U.S. Patent No. 6,580,851. In U.S. Patent No. 6,580,851, each resonator in FIG. 7 has a different resonance frequency so that different resonators in FIG. 7 add and drop different optical channels at difference frequencies.

This operation of the device in FIG. 7 is possible because different WGM resonators are not optically coupled to each other to transmit the same light. Instead, the resonators are optically coupled to the same two waveguides without being optically coupled with one another. In contrast, Claims 1-23 recite optical coupling between two WGM resonators to allow for "light coupling from a first whispering gallery mode in said first optical resonator to a second whispering gallery mode in said second optical resonator." In order to transmit any light through such two coupled WGM resonators, two WGM resonators are

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in resonance with each other. Otherwise, light will be blocked by one of the two coupled WGM resonators when the resonances of two WGM resonators are different and therefore there won't be an optical transmission through both WGM resonators.

Therefore, Claims 1-23 are different from the device in FIG. 7 of U.S. Patent No. 6,580,851 in both their structures and functions. As such, Claims 1-23 are patentable.

The second cited reference US 2002/0044739 is cited for its disclosure of radiation sensitive materials for forming a WGM resonator. However, this disclosure of radiation sensitive materials for forming a WGM resonator, if combined with FIG. 7 of U.S. Patent No. 6,580,851, does not cure the defects in the disclosure of U.S. Patent No. 6,580,851 as discussed above.

Nothing in the alleged combination suggests the optical coupling of two WGM resonators to allow for optical transmission through both resonators and the tuning of at least one of the WGM resonators "to change a property of an optical signal passing through said first and said second optical resonators."

Therefore, the alleged combination of the U.S. Patent No. 6,580,851 and US 2002/0044739 fails to disclose each feature of Claims 1-23 and thus Claims 3, 8, 9 and 19 as required under 35 USC 103(a).

In addition, Claims 18, 19, 22 and 23 allow for both permanent tuning of the optical transmission through two coupled

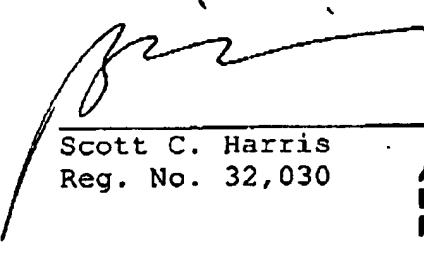
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WGM resonators during fabrication of the device and dynamic tuning of the optical transmission during operation of the device. Nothing in the prior art references on record suggests such a feature.

Therefore. Claims 1-23 are distinctly patentable either under 35 USC 102(e) over U.S. Patent No. 6,580,851 alone or under 35 USC 103(a) over U.S. Patent No. 6,580,851 in further view of US 2002/0044739 as stated in the office action.

In view of above, Applicants respectfully request the Patent Office to allow the application as currently amended. This response is filed timely and no fee is due. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,



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